

The role of tacit knowledge and the challenges in transferring it in the nuclear power plant context

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In nuclear power plant context all the relevant knowledge should be in explicit (written) form and the documentation is controlled by legislation and official regulations. However, knowledge has also a tacit element, which is the know-how of individuals including mental models, crafts, skills, intuitions, hunches and feelings which may be very difficult or even impossible to articulate [1].

In this preliminary study, the aim is to find out the role of tacit knowledge in the nuclear power plant context and the challenges related to it at the moment. Furthermore, the current methods and practices in use for transferring the tacit knowledge in power plants will also be examined [2]. The study is conducted in the two Finnish nuclear power plants, in Olkiluoto and Loviisa. The data are collected in March and April 2004 by interviewing 8-10 key informants at each plant. The interviewees are mainly middle and top management with a broad and deep view on the subject. The study is planned to be followed by a 2-3 year project, in which the transfer of tacit knowledge will be examined in four cases, in which the role and transfer of tacit knowledge has been found critical. In these cases, methods for improving the transfer of tacit knowledge will be developed, piloted and evaluated. Based on the experiences from the cases, the methods will be finally applied also to other parts of the organizations.

As a result of the data gathered so far, even though the emphasis of the knowledge in the nuclear power plant context was considered to be on explicit knowledge, also the role of tacit knowledge was considered important. The role of tacit knowledge was especially emphasized in knowledge related to e.g. the building process of the power plant (e.g. design bases and project know-how); the experience of using the power plants; finding the relevant explicit knowledge from the paper files; interpreting and evaluating the resonance of issues and situations; the know-how embedded in commissioning as well as public approval; domestic and international relations; and fuel acquisition and radioactive waste management. The role of tacit knowledge in the nuclear power plant context was considered critical at least for three reasons: 1) the nuclear technology is remarkably complex; 2) nuclear know-how is only in hands of a few in Finland; and 3) the safety and quality of operation in nuclear context are extremely important.

The most significant challenge in transferring the tacit knowledge was seen the forthcoming retirement of a large proportion of staff who had worked in the nuclear power plant from the beginning. These employees have tacit knowledge related to e.g. the commissioning and initial operations of the power plant, and huge experience in using the power plants as well as effective domestic and international relations. The fact that this kind of tacit knowledge is in hands of a few had not earlier caused problems as the turnover of the workers have been low. The challenge of ageing workforce of the nuclear power industry has been noticed elsewhere as well [3]. On the other hand, not all of the

tacit knowledge embedded in these experts were considered worth transferring: especially some customs and practices were found more effective among the younger generation, and some prevailing practices were not desired to be maintained.

Another challenge related to the tacit knowledge was the building of new nuclear plants and documenting the knowledge related to the process so that it would be as much in explicit form as possible and the transfer of the remaining tacit knowledge would be effectively controlled and planned. Furthermore, challenges were also found in creating new training material and developing more multifaceted and interactive training, which would lead not only to transfer of explicit knowledge but also to effective transfer of tacit knowledge as well.

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